NAME

twe - 3ware 5000/6000/7000/8000 series PATA/SATA RAID adapter driver

SYNOPSIS

To compile this driver into the kernel, place the following lines in your kernel configuration file:

> **device pci**
> **device twe**

Alternatively, to load the driver as a module at boot time, place the following line in loader.conf(5):

> twe_load="YES"

DEPRECATION NOTICE

The **twe** driver is not present in FreeBSD 14.0.

DESCRIPTION

The **twe** driver provides support for AMCC's 3ware 5000/6000/7000/8000 series PATA/SATA RAID adapters. These adapters were formerly known as "3ware Escalade".

These devices support 2, 4, 8, or 12 ATA disk drives and provide RAID0 (striping) and RAID1 (mirroring) functionality.

HARDWARE

The **twe** driver supports the following PATA/SATA RAID controllers:

- AMCC's 3ware 5000 series
- AMCC's 3ware 6000 series
- AMCC's 3ware 7000-2
- AMCC's 3ware 7006-2
- AMCC's 3ware 7500-4LP
- AMCC's 3ware 7500-8
- AMCC's 3ware 7500-12
- AMCC's 3ware 7506-4LP
- AMCC's 3ware 7506-8
- AMCC's 3ware 7506-12
- AMCC's 3ware 8006-2LP
- AMCC's 3ware 8500-4LP
- AMCC's 3ware 8500-8
- AMCC's 3ware 8500-12

- ⊕ AMCC's 3ware 8506-4LP
- ⊕ AMCC's 3ware 8506-8
- ⊕ AMCC's 3ware 8506-8MI
- ⊕ AMCC's 3ware 8506-12
- ⊕ AMCC's 3ware 8506-12MI

DIAGNOSTICS

Controller initialisation phase
twe%d: microcontroller not ready

The controller's onboard CPU is not reporting that it is ready; this may be due to either a board or system failure. Initialisation has failed.

twe%d: no attention interrupt
twe%d: can't drain AEN queue
twe%d: reset not reported
twe%d: controller errors detected
twe%d: can't drain response queue
twe%d: reset %d failed, trying again

The controller is not responding correctly to the driver's attempts to reset and initialise it. This process is retried several times.

twe%d: can't initialise controller, giving up

Several attempts to reset and initialise the controller have failed; initialisation has failed and the driver will not attach to this controller.

Driver initialisation/shutdown phase
twe%d: register window not available
twe%d: can't allocate register window
twe%d: can't allocate parent DMA tag
twe%d: can't allocate interrupt
twe%d: can't set up interrupt
twe%d: can't establish configuration hook

A resource allocation error occurred while initialising the driver; initialisation has failed and the driver will not attach to this controller.

twe%d: can't detect attached units

Fetching the list of attached units failed; initialisation has failed.

twe%d: error fetching capacity for unit %d
twe%d: error fetching state for unit %d
twe%d: error fetching descriptor size for unit %d
twe%d: error fetching descriptor for unit %d
twe%d: device_add_child failed
twe%d: bus_generic_attach returned %d

Creation of the disk devices failed, either due to communication problems with the adapter or due to resource shortage; attachment of one or more units may have been aborted.

Operational phase
twe%d: command completed - %s

A command was reported completed with a warning by the controller. The warning may be one of:

redundant/inconsequential request ignored
failed to write zeroes to LBA 0
failed to profile TwinStor zones

twe%d: command failed - %s

A command was reported as failed by the controller. The failure message may be one of:

aborted due to system command or reconfiguration
aborted
access error
access violation
device failure
controller error
timed out
invalid unit number
unit not available
undefined opcode
request incompatible with unit
invalid request
firmware error, reset requested

The command will be returned to the operating system after a fatal error.

twe%d: command failed submission - controller wedged

A command could not be delivered to the controller because the controller is unresponsive.

twe%d: AEN: <%s>

The controller has reported a change in status using an AEN (Asynchronous Event Notification). The
following AENs may be reported:

queue empty
soft reset
degraded mirror
controller error
rebuild fail
rebuild done
incomplete unit
initialisation done
unclean shutdown detected
drive timeout
drive error
rebuild started
aen queue full

AENs are also queued internally for use by management tools.

twe%d: error polling for signalled AENs

The controller has reported that one or more status messages are ready for the driver, but attempting to
fetch one of these has returned an error.

twe%d: AEN queue overflow, lost AEN <%s>

A status message was retrieved from the controller, but there is no more room to queue it in the driver.
The message is lost (but will be printed to the console).

twe%d: missing expected status bits %s
twe%d: unexpected status bits %s

A check of the controller's status bits indicates an unexpected condition.

twe%d: host interrupt

The controller has signalled a host interrupt. This serves an unknown purpose and is ignored.

twe%d: command interrupt

The controller has signalled a command interrupt. This is not used, and will be disabled.

twe%d: controller reset in progress...

The controller is being reset by the driver. Typically this is done when the driver has determined that the controller is in an unrecoverable state.

twe%d: can't reset controller, giving up

The driver has given up on resetting the controller. No further I/O will be handled.

controller reset done, %d commands restarted

The controller was successfully reset, and outstanding commands were restarted.

AUTHORS

The **twe** driver and manual page were written by Michael Smith *<msmith@FreeBSD.org>*.

Extensive work done on the driver by Vinod Kashyap *<vkashyap@FreeBSD.org>* and Paul Saab *<ps@FreeBSD.org>*.

BUGS

The controller cannot handle I/O transfers that are not aligned to a 512-byte boundary. In order to support raw device access from user-space, the driver will perform alignment fixup on non-aligned data. This process is inefficient, and thus in order to obtain best performance user-space applications accessing the device should do so with aligned buffers.